

**STATE OF VERMONT
PUBLIC SERVICE BOARD**

DOCKET NO. 6860

Petitions of Vermont Electric Power Company)
Inc. (VELCO) and Green Mountain Power)
Corporation (GMP) for a certificate of public)
good, pursuant to 30 V.S.A. Section 248,)
authorizing VELCO to construct the so-called)
Northwest Reliability Project)

**PREFILED SURREBUTTAL TESTIMONY OF
CARLA A. WHITE**

And

LAWRENCE G. CRIST

**ON BEHALF OF
VERMONT DEPARTMENT OF PUBLIC SERVICE**

July 26, 2004

Summary: The purpose of Ms. White's and Mr. Crist's testimony is to address the rebuttal testimony of VCSE's witness Dulsky and the Towns' witness Emerson with respect to electric and magnetic fields.

1 Q1. Please state your name and business address.

2 A1. Carla A. White:

3 My name is Carla A. White. My business address is Radiological Health, Health
4 Protection, Vermont Department of Health, 108 Cherry Street, PO Box 70, Burlington, VT
5 05402-0070.

6 Lawrence G. Crist:

7 My name is Lawrence G. Crist. My business address is Health Protection, Vermont
8 Department of Health, 108 Cherry Street, PO Box 70, Burlington, VT 05402-0070.

9

10 Q2. By whom are you employed and in what capacity?

11 A2. Carla A. White:

12 I am employed by the Vermont Department of Health as a Senior Radiological Health
13 Specialist.

14 Lawrence G. Crist:

15 I am employed by the Vermont Department of Health as Director of the Division of
16 Health Protection.

17

18 Q3. Have you previously provided testimony in this case.

19 A3. Yes.

20

21

1 Q4. What is the purpose of your testimony?

2 A4. We have reviewed the rebuttal testimony of VCSE's witness Dulsky and the Towns'
3 witness Emerson and provide this testimony to address those witnesses' statements and
4 recommendations with respect to electric and magnetic fields.

5
6 Q5. Please refer to Dr. Dulsky's answer to Question 6 on page 3 of her testimony, and
7 specifically to her statement that the Board should take all possible steps to minimize
8 exposure to EMF until certainty of safety has been established. Please explain whether you
9 agree or disagree with that statement.

10 A5. We disagree with this statement because it is virtually impossible to prove that there
11 is an absolute certainty of safety from any type of activity. Because of the scientific
12 uncertainty of the effect of power frequency EMF on human health, the policy of prudent
13 avoidance is used to balance the actions of avoiding potential harm and the costs attached to
14 these actions. Please refer to prefiled testimony of December 17, 2003 for a discussion of the
15 Vermont Twenty Year Electric Plan (1994) Policy of Prudent Avoidance.

16 Q6. Please refer to Dr. Dulsky's answer to Question 7 on page 4 of her testimony, and
17 specifically to her recommendation that chronic exposure to EMF should be limited to 3 to 4
18 mG. Please explain whether you agree or disagree with that recommendation.

19 A6. The VDH does not believe that it is appropriate at this time to establish a limit of 3 to
20 4mG for EMF emitted by overhead transmission power lines or underground cables for this
21 project because:

- 1 1. data in the current body of literature is insufficient to establish a direct cause
- 2 and effect relationship between EMF exposure and adverse health effects,
- 3 2. epidemiological studies do not show a consistent association between
- 4 exposure to EMF and adverse health effects,
- 5 3. there is little evidence of the effect of power frequency EMF on cells, tissues
- 6 or animals below 1000 mG, and
- 7 4. there is no known biological mechanism for how EMF would cause cancer.

8 It also should be noted:

- 9 1. the average home encompasses a range of EMF strengths from 0.1 to 4 mG,
- 10 2. no other States have instituted health based standards to EMFs from
- 11 transmission lines,
- 12 3. Existing transmission lines along the proposed corridor emit EMFs in a range
- 13 of 2 to 45 mG with average loading at the edge of the ROW and of 12 to 208
- 14 mG with maximum continuous loading at the edge of the ROW, with no
- 15 evidence of adverse health effects, and
- 16 4. ICNIRP has established health-based EMF standards of 833mG.

17 Creation of a health-based standard for power frequency EMF of 3 to 4 mG is not
18 justified at this time. If EMFs in excess of 3 to 4 mG were creating a health problem we
19 would be seeing many more childhood leukemia cases than we are at the present time, which
20 we are not as Mr. Crist testified in this proceeding on February 24, 2004. For an average
21 relative risk of 2.0, which has been calculated from epidemiological studies from exposure to
22 EMF, we would expect to see 9 new cases of childhood leukemia per year in Vermont and

1 we are not. We are seeing about 6 cases a year, which is less than that, and is fully consistent
2 with the national average rate we would expect to see based on population. In addition, the
3 scientific community continues to look aggressively for a connection between EMF and
4 certain diseases, particularly childhood leukemia, but there is insufficient evidence to
5 establish a direct cause and effect relationship between the EMFs and childhood leukemia.)

6 The Vermont Department of Health concludes that the policy of prudent avoidance as
7 delineated in the Vermont Twenty Year Electric Plan (1994) continues to be appropriate for
8 evaluation of this project.

9
10 Q7. Please refer to the prefiled rebuttal testimony of Mr. Emerson, and in particular the
11 concerns he expresses regarding EMFs. Please describe any steps you have taken to evaluate
12 the potential exposure of the students at the Waldorf School in Charlotte to EMFs.

13 A7. The Vermont Department of Health (“VDH”) considered the issue of electric and
14 magnetic power frequency fields (“EMF”) from the proposed overhead transmission line and
15 underground transmission cable and their possible health effects on the students in the
16 Waldorf High School in Charlotte very seriously. We surveyed the site on July 22, 2004.
17 The strength of the magnetic power frequency field under the present overhead 34.5 kV
18 power line was 2.5 mG compared to a background of approximately 1 mG away from the
19 power line. We were given permission to survey the inside building and found the following
20 EMF fields:

21 Background of approximately 1.5 mG in the middle of all rooms

22 Electric Panels in room behind reception area:

1 Background of 1.6 mG in the middle of the room
2 Large electric panel on left: 119 mG on contact and 32 mG at 1 foot away
3 Upper electric panel on right: 45 mG on contact
4 Lower electric panel on right: 119 mG on contact
5 Electric panel on wall to right: 11 mG on contact
6 Door facing the 34.5 kV power lines in the hand-work art room: 1.8 mG
7 Computer: 15 mG on contact and 2 mG at 2 feet away
8 Fluorescent overhead light fixture: Ranges from 2 mG to 39 mG on contact
9 Fine arts room closest to railroad: 1.5 mG
10 Refrigerator:
11 14 mG at front on contact
12 42 mG in back on contact
13 Water cooler: 28 mG on contact

14 These are all consistent with typical EMF strengths found in homes and for home appliances.
15

16 In addition, using the same methodology we have used throughout our analysis of this
17 project, we calculated the projected EMFs within the school at the closest approach to the
18 school from the existing 34.5 kV line (20 feet away), the original proposed route (160 feet
19 away), the LandWorks Charlotte Alternative (18 to 23 feet away) and from a hypothetical
20 underground transmission cable (18 feet away). The results of these calculations are
21 contained in the table attached as Exhibit DPS-VDH-7.

1 Q8. Please explain whether VDH has formed an opinion on whether the location of a pole
2 close to the Waldorf School as provided in the Landworks proposed route poses a health risk
3 to the students.

4 A8. The VDH concludes that the projected magnetic power frequency fields for all
5 alternatives at the closest approach to the school are less than the health-based ICNIRP
6 guideline of 833 mG and therefore would not pose an adverse health risk. The expected
7 EMF from the pole close to the school, as proposed by Landworks, would be expected to
8 increase the EMF from the present levels that currently result from the existing transmission
9 line. The present average EMF level in the Fine Arts room is 1.5 mG and is projected to
10 increase to between 20 mG and 24 mG in 2012 at the wall closest to the railroad track. The
11 EMF strength in the middle of the room will be less due to the increased distance away from
12 the overhead transmission line. The VDH notes that this is 34 times less than the health
13 based ICNIRP standard and is comparable to levels of exposure from computer monitor
14 screens, refrigerator and water coolers used in the school as listed in A7 above. However,
15 this level would not be expected in other areas of the building, due to increased distance from
16 the proposed transmission line and from any metallic material in the walls. The projected
17 EMFs as listed in DPS-VDH-7 are not of concern because these levels are typically
18 encountered in every day life from indoor wiring, appliances, etc.

19 Q9. Please explain whether VDH has any concerns if the transmission line were buried on
20 the east side of the Waldorf School.

21 A9. Most students attending the Waldorf School will need to cross over the underground
22 transmission cable or under the overhead transmission line in order to get to the school, on

1 foot or by vehicle. If traveling by foot, based on the calculations in our Underground
2 Supplement report, the EMF strength would vary from a minimum of 36 mG to 5,308 mG for
3 an underground transmission cable and 38 mG to less than 282 mG for the overhead
4 transmission line. On average the EMF from the underground transmission cable would be
5 higher than the EMF from the overhead transmission line. The VDH concludes that the
6 magnetic power frequency fields from an underground transmission cable may pose a public
7 health hazard to students and some method of reducing the EMF or restricting use of that
8 area would need to be employed, as discussed in our Underground Supplement.

9
10 Q10. Does this conclude your surrebuttal testimony?

11 A10. Yes.